FIG. 1

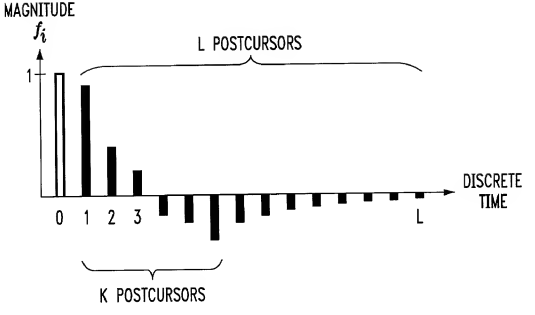

MAGNITUDE
f_i
1
L POSTCURSORS
DISCRETE TIME
0 1 2 3
L
K POSTCURSORS

FIG. 2

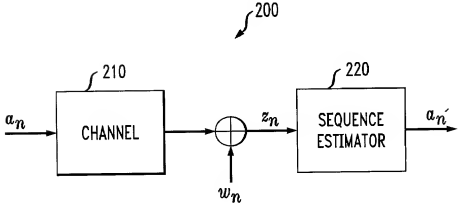

200
210
220
a_n
CHANNEL
z_n
SEQUENCE ESTIMATOR
$a_{n'}$
w_n

FIG. 3

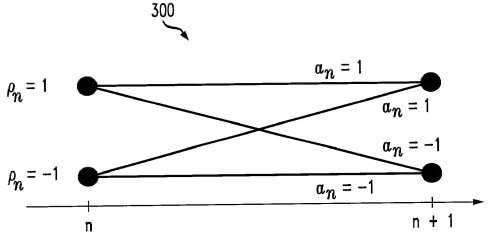

300
$\rho_n = 1$
$\rho_n = -1$
$a_n = 1$
$a_n = 1$
$a_n = -1$
$a_n = -1$
n
n + 1

FIG. 4

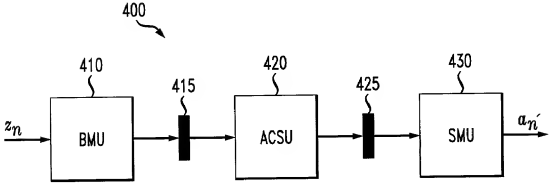

400
410
415
420
425
430
z_n
BMU
ACSU
SMU
$a_{n'}$

FIG. 5

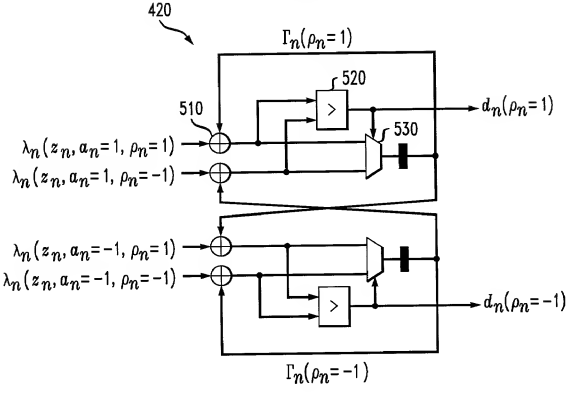


FIG. 6

COMPLEXITY AND CRITICAL PATH ANALYSIS TABLE -- 600

	620 MLSE	630 RSSE
COMPLEXITY		
NO. OF STATES:	2^L	2^K
NO. OF BMs	2^{L+1}	2^{K+1}
ADDs IN DFU:	——	$S \times L$
CRITICAL PATH	2 ADDs 2-to-1 MUX	$L-K+3$ ADDs 2-to-1 MUX LUT SHIFT

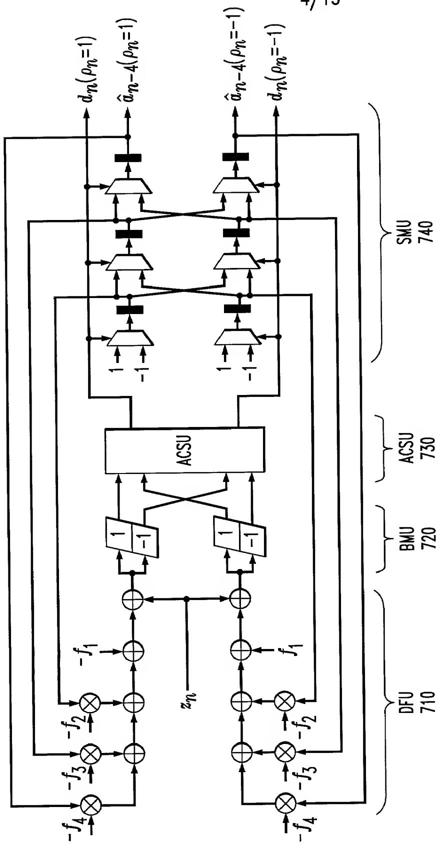

700
$-f_4$
$-f_3$
$-f_2$
$-f_1$
f_1
z_n
ACSU
1
-1
$d_n(\rho_n=1)$
$\hat{a}_{n-4}(\rho_n=1)$
$\hat{a}_{n-4}(\rho_n=-1)$
$d_n(\rho_n=-1)$
DFU
710
BMU
720
ACSU
730
SMU
740

FIG. 7A

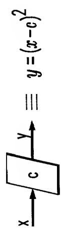

x
c
y
$\equiv$
$y=(x-c)^2$

FIG. 7B

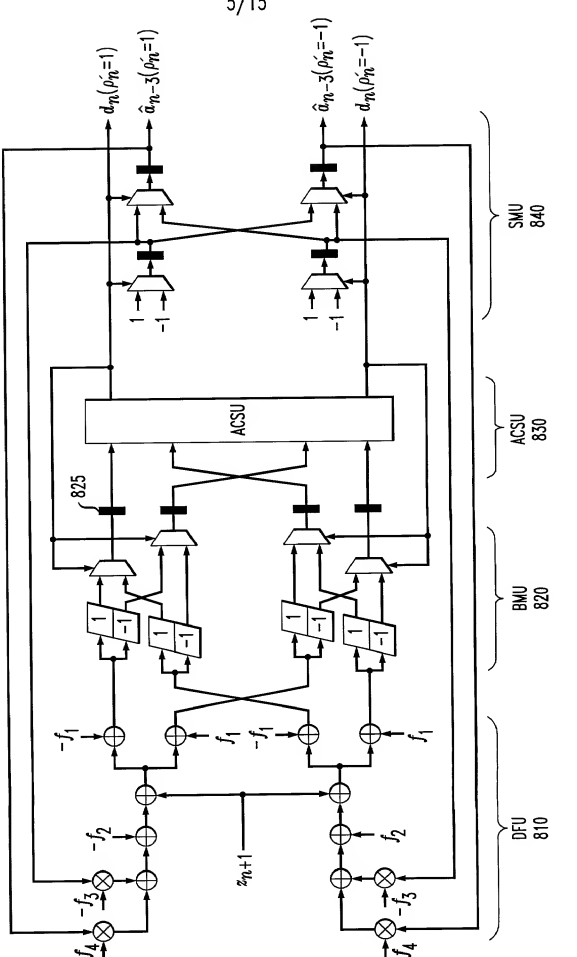

$d_n(\rho_n=1)$
$\hat{a}_{n-3}(\rho_n=1)$
$\hat{a}_{n-3}(\rho_n=-1)$
$d_n(\rho_n=-1)$
1
-1
825
ACSU
SMU
840
ACSU
830
BMU
820
DFU
810
$-f_1$
f_1
$-f_2$
f_2
$-f_3$
$-f_4$
z_{n+1}

FIG. 8

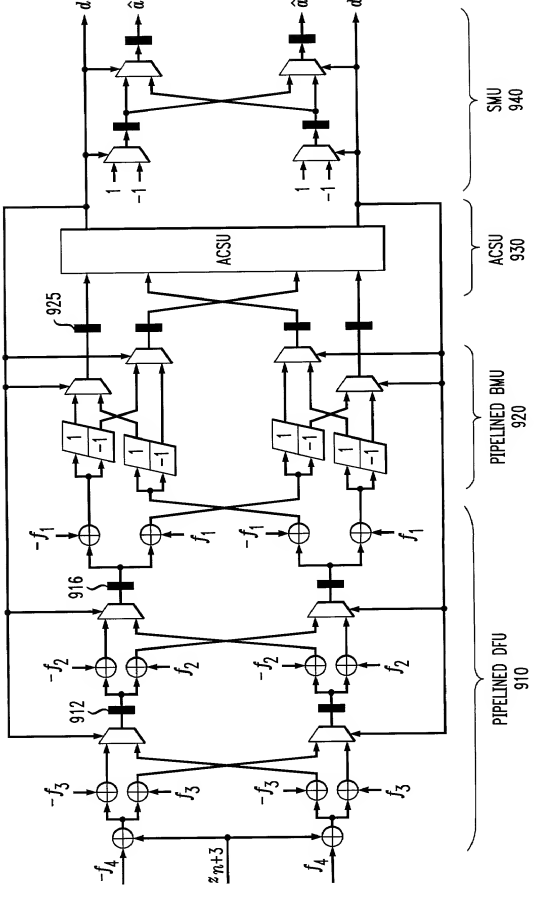

$d_n(\rho_n=1)$
$\hat{a}_{n-3}(\rho_n=1)$
$\hat{a}_{n-3}(\rho_n=-1)$
$d_n(\rho_n=-1)$
ACSU
925
916
912
$-f_1$
f_1
$-f_2$
f_2
$-f_3$
f_3
$-f_4$
f_4
z_{n+3}
1
-1
PIPELINED DFU 910
PIPELINED BMU 920
ACSU 930
SMU 940

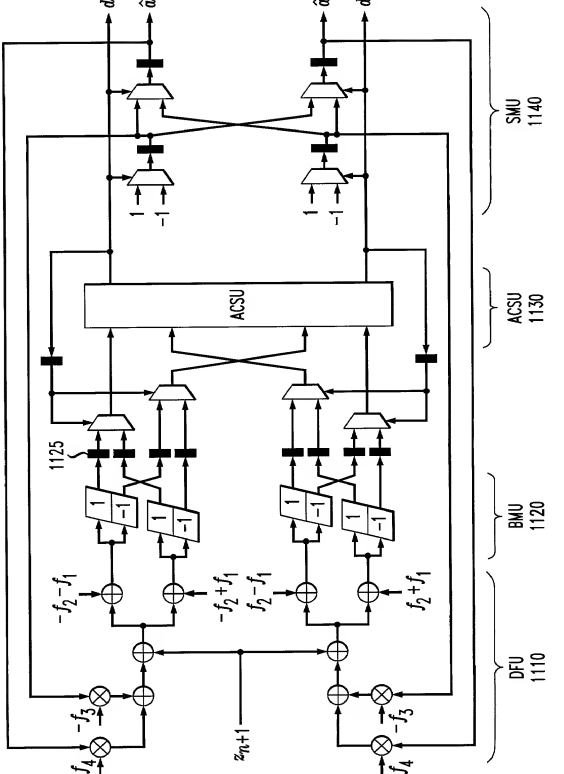
FIG. 9

FIG. 10

COMPLEXITY AND CRITICAL PATH ANALYSIS TABLE OF PIPELINED RSSE -- 1000

	PIPELINED RSSE
COMPLEXITY	
NO. OF BMs:	2^{K+2}
ADDs IN DFU:	$S \times (L-M+2M) = S \times (L+M)$
CRITICAL PATH $(M=L-K)$	2 ADDs 2-to-1 MUX

FIG. 11


DFU 1110
BMU 1120
ACSU 1130
SMU 1140
ACSU
1125
z_{n+1}
$-f_4$
$-f_3$
$-f_2-f_1$
$-f_2+f_1$
f_2-f_1
f_2+f_1
1
-1
$d_n(\rho_n=1)$
$\hat{a}_{n-3}(\rho_n=1)$
$\hat{a}_{n-3}(\rho_n=-1)$
$d_n(\rho_n=-1)$

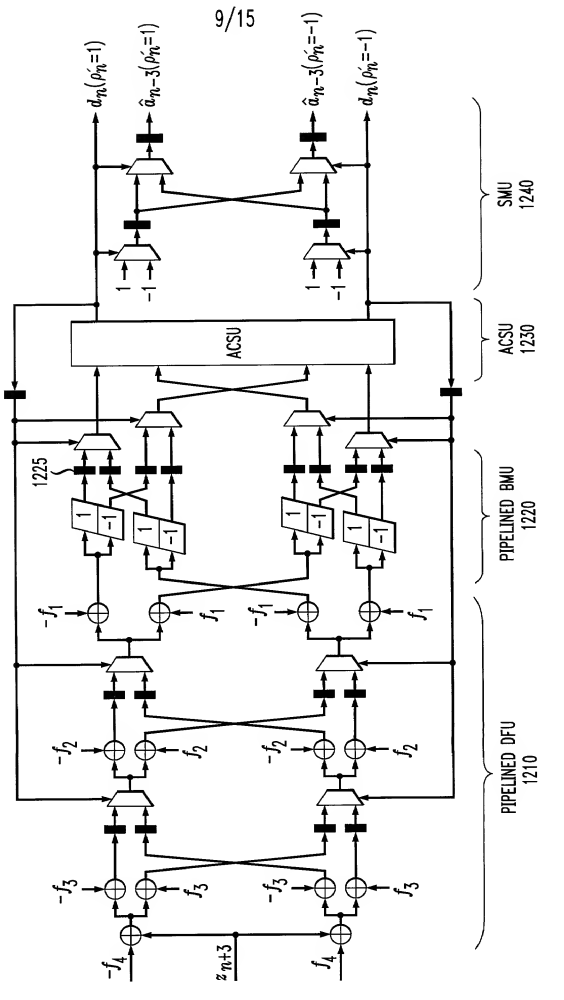

$d_n(\rho_n=1)$
$\hat{a}_{n-3}(\rho_n=1)$
$\hat{a}_{n-3}(\rho_n=-1)$
$d_n(\rho_n=-1)$
ACSU
1225
$-f_1$
f_1
$-f_2$
f_2
$-f_3$
f_3
$-f_4$
f_4
z_{n+3}
PIPELINED DFU 1210
PIPELINED BMU 1220
ACSU 1230
SMU 1240

FIG. 12

FIG. 13

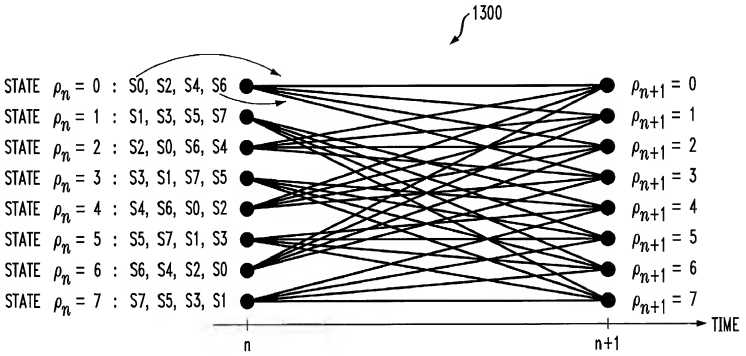
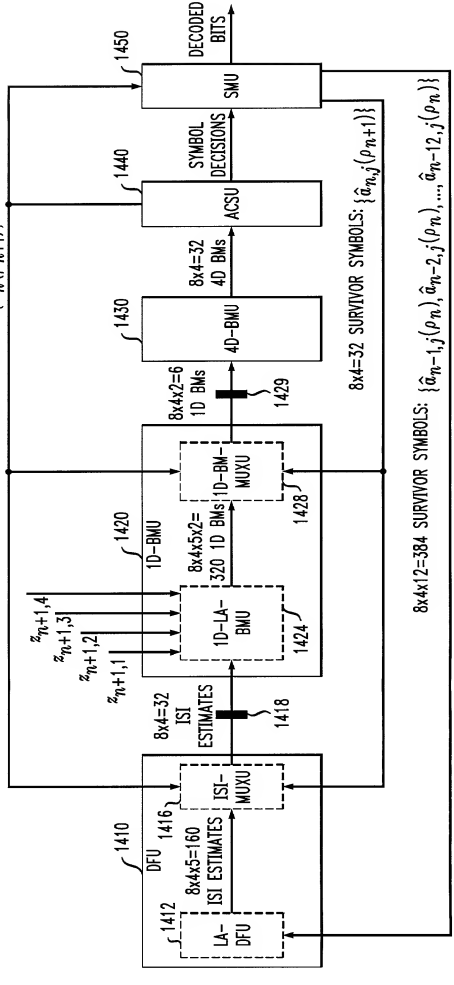

1300
STATE ρ_n = 0 : S0, S2, S4, S6
STATE ρ_n = 1 : S1, S3, S5, S7
STATE ρ_n = 2 : S2, S0, S6, S4
STATE ρ_n = 3 : S3, S1, S7, S5
STATE ρ_n = 4 : S4, S6, S0, S2
STATE ρ_n = 5 : S5, S7, S1, S3
STATE ρ_n = 6 : S6, S4, S2, S0
STATE ρ_n = 7 : S7, S5, S3, S1
ρ_{n+1} = 0
ρ_{n+1} = 1
ρ_{n+1} = 2
ρ_{n+1} = 3
ρ_{n+1} = 4
ρ_{n+1} = 5
ρ_{n+1} = 6
ρ_{n+1} = 7
TIME
n
n+1

FIG. 14


1410
DFU
1416
8x4x5=160
ISI ESTIMATES
1412
LA-DFU
ISI-MUXU
8x4=32
ISI
ESTIMATES
1418
$z_{n+1,1}$
$z_{n+1,2}$
$z_{n+1,3}$
$z_{n+1,4}$
1420
1D-BMU
1D-LA-BMU
1424
8x4x5x2=
320 1D BMs
1D-BM-MUXU
1428
8x4x2=6
1D BMs
1429
1430
4D-BMU
8x4=32
4D BMs
1440
ACSU
SYMBOL
DECISIONS
1450
SMU
DECODED
BITS
8 ACS DECISIONS: $\{d_n(\rho_{n+1})\}$
8x4=32 SURVIVOR SYMBOLS: $\{\hat{a}_{n,j}(\rho_{n+1})\}$
8x4x12=384 SURVIVOR SYMBOLS: $\{\hat{a}_{n-1,j}(\rho_n), \hat{a}_{n-2,j}(\rho_n), ..., \hat{a}_{n-12,j}(\rho_n)\}$

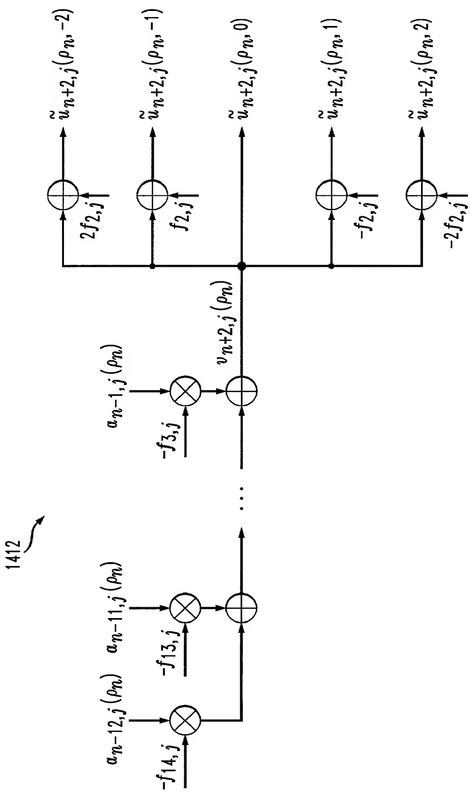

1412
$a_{n-12,j}(\rho_n)$
$-f_{14,j}$
$a_{n-11,j}(\rho_n)$
$-f_{13,j}$
$a_{n-1,j}(\rho_n)$
$-f_{3,j}$
$v_{n+2,j}(\rho_n)$
$2f_{2,j}$
$f_{2,j}$
$-f_{2,j}$
$-2f_{2,j}$
$\tilde{u}_{n+2,j}(\rho_n,-2)$
$\tilde{u}_{n+2,j}(\rho_n,-1)$
$\tilde{u}_{n+2,j}(\rho_n,0)$
$\tilde{u}_{n+2,j}(\rho_n,1)$
$\tilde{u}_{n+2,j}(\rho_n,2)$

FIG. 15

FIG. 16

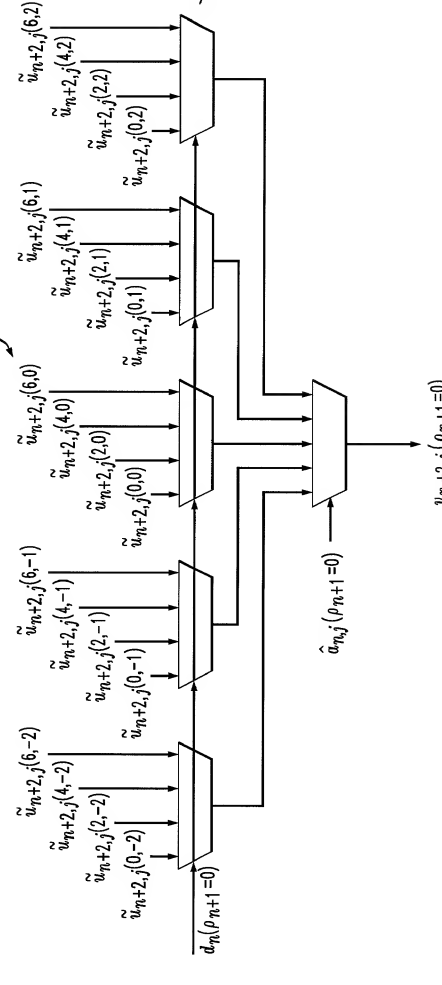
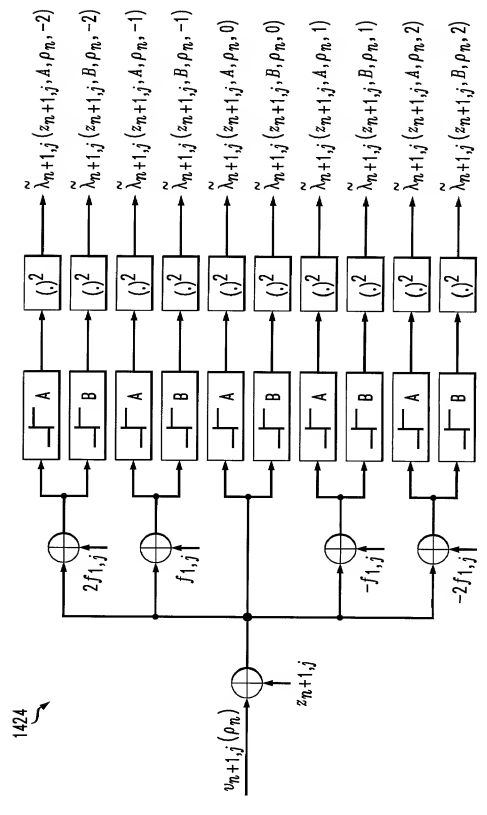

1416
$\tilde{u}_{n+2,j}(6,2)$
$\tilde{u}_{n+2,j}(4,2)$
$\tilde{u}_{n+2,j}(2,2)$
$\tilde{u}_{n+2,j}(0,2)$
$\tilde{u}_{n+2,j}(6,1)$
$\tilde{u}_{n+2,j}(4,1)$
$\tilde{u}_{n+2,j}(2,1)$
$\tilde{u}_{n+2,j}(0,1)$
$\tilde{u}_{n+2,j}(6,0)$
$\tilde{u}_{n+2,j}(4,0)$
$\tilde{u}_{n+2,j}(2,0)$
$\tilde{u}_{n+2,j}(0,0)$
$\tilde{u}_{n+2,j}(6,-1)$
$\tilde{u}_{n+2,j}(4,-1)$
$\tilde{u}_{n+2,j}(2,-1)$
$\tilde{u}_{n+2,j}(0,-1)$
$\tilde{u}_{n+2,j}(6,-2)$
$\tilde{u}_{n+2,j}(4,-2)$
$\tilde{u}_{n+2,j}(2,-2)$
$\tilde{u}_{n+2,j}(0,-2)$
$d_n(\rho_{n+1}=0)$
$\hat{a}_{n,j}(\rho_{n+1}=0)$
$v_{n+2,j}(\rho_{n+1}=0)$

FIG. 17


1424
$v_{n+1,j}(\rho_n)$
$z_{n+1,j}$
$2f_{1,j}$
$f_{1,j}$
$-f_{1,j}$
$-2f_{1,j}$
A
B
$(.)^2$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, A, \rho_n, -2)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, B, \rho_n, -2)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, A, \rho_n, -1)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, B, \rho_n, -1)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, A, \rho_n, 0)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, B, \rho_n, 0)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, A, \rho_n, 1)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, B, \rho_n, 1)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, A, \rho_n, 2)$
$\tilde{\lambda}_{n+1,j}(z_{n+1,j}, B, \rho_n, 2)$

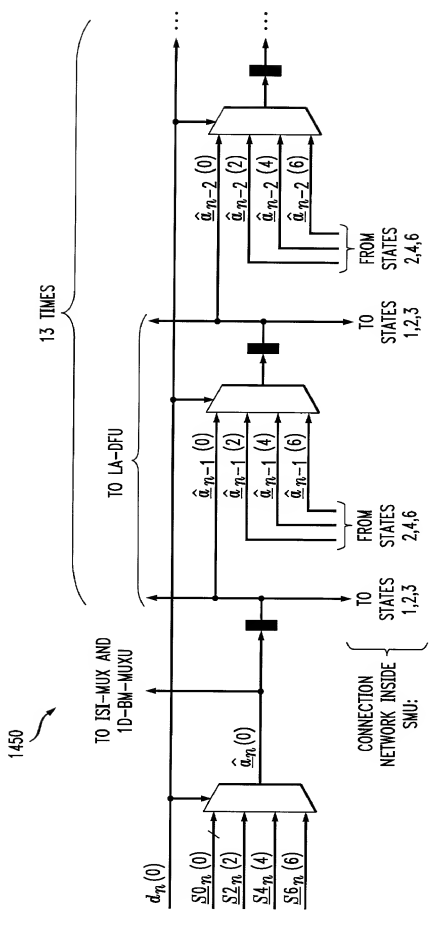

1450
13 TIMES
TO ISI-MUX AND 1D-BM-MUXU
TO LA-DFU
$d_n(0)$
$S0_n(0)$
$S2_n(2)$
$S4_n(4)$
$S6_n(6)$
$\hat{a}_n(0)$
$\hat{a}_{n-1}(0)$
$\hat{a}_{n-1}(2)$
$\hat{a}_{n-1}(4)$
$\hat{a}_{n-1}(6)$
$\hat{a}_{n-2}(0)$
$\hat{a}_{n-2}(2)$
$\hat{a}_{n-2}(4)$
$\hat{a}_{n-2}(6)$
CONNECTION NETWORK INSIDE SMU:
TO STATES 1,2,3
FROM STATES 2,4,6
TO STATES 1,2,3
FROM STATES 2,4,6

FIG. 18